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SCIENCE NEWS LETTER

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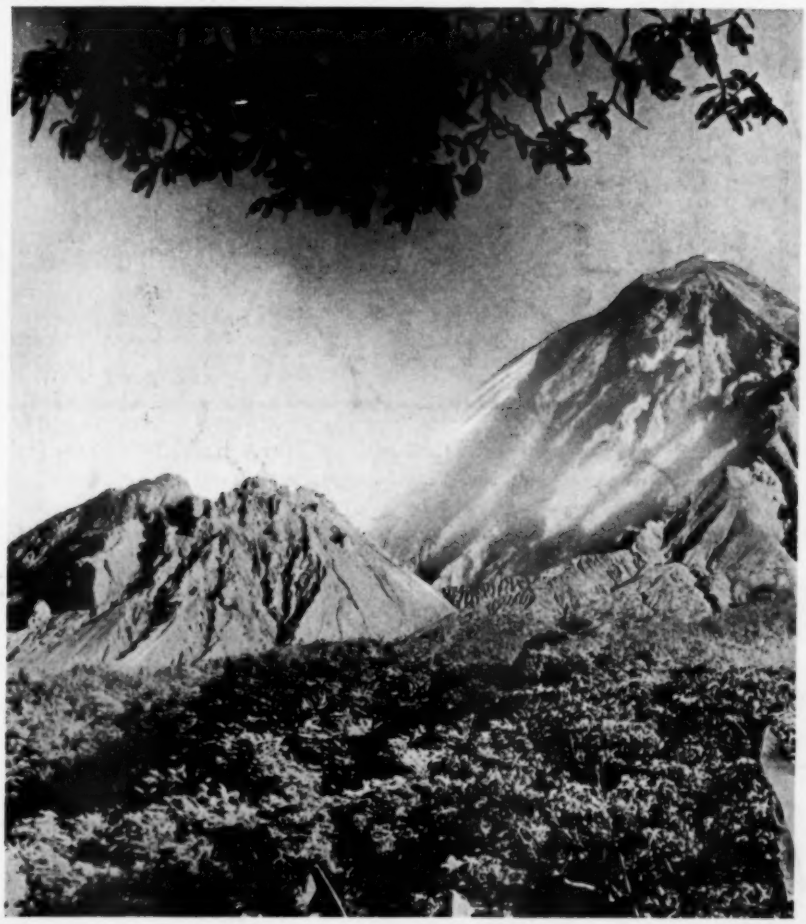
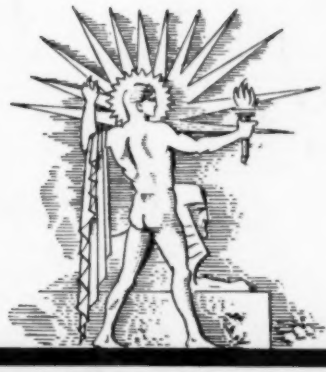
THE WEEKLY SUMMARY OF CURRENT SCIENCE •





September 30, 1939

Baby Volcano

See page 222

A SCIENCE SERVICE PUBLICATION

Do You Know?

African pigmies raise no crops, and live entirely by hunting.

Approximately 80 by-products are now obtained in the beef cattle industry.

The true antelope, found only in Africa, has curved horns without prongs.

The major use for buttermilk now—aside from food for man and beast—is in paint.

Dogs that help guard the Kimberley diamond mines in Africa are Alsatians and bull mastiffs.

In fish that lack scales, it may be possible to judge the age by examining the year rings in the vertebrae.

Ninety per cent of tire troubles and tire accidents occur during the last 2,000 or 3,000 miles of the tire's life.

Soap nuts, which grow on trees in India, have been used there since ancient times to wash textiles and jewelry.

The forest of semi-arid western United States is mainly pinon pine and Utah juniper, trees of low commercial value.

Greek Olympic Games at one time included a race by men wearing heavy armor, considered valuable training for active duty.

India is planning to take stock of its mineral springs to determine the physical and chemical properties of the waters and their possible therapeutic value.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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PUBLIC HEALTH

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ZOOLOGY

How rapidly do deer antlers grow? p. 212.

Under what conditions can the tail of a worm grow a new head? p. 217.

Diamonds will burn if heated to about 800 degrees Centigrade in air.

Germany has 340 people to the square mile, or fewer than Great Britain, Netherlands, or Belgium.

Snow fences made of living trees instead of pickets are being tried along Wisconsin highways, and are believed economical.

There have been more than 4,000 makes of automobiles since the first car propelled by an internal combustion engine appeared in France in 1868.

An official of the Agricultural Adjustment Administration says: "According to a recent study of the period, the vigor of the early Roman Republic was sapped by draining the farmers into the Roman legions."

SCIENCE NEWS LETTER

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GENERAL SCIENCE

Leading Science Journals Pledge Aid to Europe's War

Die Umschau and Nature Both Offer Support of Men Of Science to Service of Their Respective Causes

COMPLETE absorption of British scientific men in the task of winning the war is pledged in the leading editorial in the first post-outbreak issue of *Nature,* (Sept. 9) most widely circulated of British science journals.

"For the moment, the interests of pure science as an intellectual pursuit and discipline must remain in abeyance," the statement declares.

Blame for the war is fixed on "the cynical disregard of Germany for the rights of small nations," and it is asserted that the British people have accepted the challenge reluctantly, but with a grim determination that the cause which it holds just shall prevail.

The editorial, however, looks forward to a post-war world in which renewed efforts must be made to reconstruct a society of nations on a basis of justice and equity. No attempt is made to forecast the form which the new international cooperation will take, but the task is recognized as one that definitely must be undertaken.

The article says, in part:

"In no previous war has science played so great a part as that which will be demanded of it in the struggle that is at hand. For a time, while the issue hangs in the balance, it is the duty of the man of science to lay aside his just misgivings whether the greatest force of the human intellect should thus be harnessed to the forces of destruction. For the moment, the interests of pure science as an intellectual pursuit and discipline must remain in abeyance. The energies, the abilities, and the knowledge of each and every individual with scientific training must be directed without remission to the service of the Allied cause.

"Nevertheless, the end to be attained, and the end which science should hold ceaselessly before the eyes of the Allied peoples, is not destruction, but a constructive ideal—to ensure in the future such conditions as will make possible the advancement of all the peoples of the world without discrimination, according to the status and the traditions of each, in the light shed by (*Turn to page 222*)

THE WIDELY read German science weekly, *Die Umschau,* (Sept. 10) in its first issue dated after the declaration of war, declares that Germany's accomplishments under the Four Year Plan justify a demand for "Lebensraum" and formally pledges that German science and technology will support the Fuehrer "to the utmost."

The main text of the magazine, evidently edited before the outbreak of hostilities, has no mention of the war. But a supplementary leaflet inserted reads in translation as follows:

"The Fuehrer demonstrated, in his great speech before the Reichstag on September 1, that Germany must fight to protect the vital rights of the nation.

"Under the leadership of Adolf Hitler, the German people have worked for six years on their own reconstruction. Like the German workingman, the German scientist pledged himself to do his part toward the strengthening of the people. Here also the Fuehrer showed the way. The technical accomplishments—his edifices, his highways—stand before the eyes of all. Less evident, but not less important, are the fruits of German science, that first made it possible to solve the great problems of the Four Year Plan. The provision of raw materials was vastly increased—the erection of industry could go forward on a broad foundation. Innumerable new industrial materials were brought into being, and the social, hygienic and racial measures were carried through to the greatest extent.

"A people, that under its Fuehrer could carry out such mightly works in so short a time, has through that alone justified its existence and established its claim to living space (Lebensraum). No power in the world can restrain us from defending these rights to the utmost. With faith in our Fuehrer the whole German people will battle to the fullfilment of these demands. Like every other class, German science and technology will venture every pledge."

Science News Letter, September 30, 1939

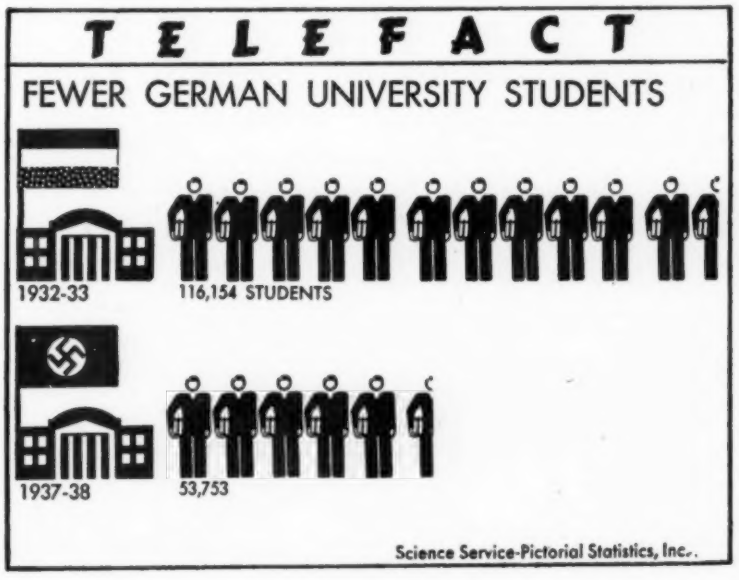
PHYSICS

Air In Stratosphere Is Hot Enough To Boil Water

AT 38 miles above the earth's surface the temperature is 100 degrees Centigrade, the boiling point of water, Dr. Fred L. Whipple, Harvard astronomer, told the meeting of the International Union of Geodesy and Geophysics in Washington, D. C.

Dr. Whipple's discovery was accomplished with a new type of "meteor speedometer" which uses the appearance of shooting star tracks in the sky to tell temperatures in the stratosphere far beyond the reach of man.

With his new apparatus Dr. Whipple obtains very accurate measurements of the height, brightness, velocity and de-



celeration of meteors which flash briefly in the area about 30 to 60 miles above the earth.

At heights of 70 miles above the earth the temperature is found to be 20 degrees Centigrade, ordinary room temperature.

The basic principle of Dr. Whipple's apparatus is to revolve a fan blade in front of a telescope-camera lens in such a way that if a meteor flashes down across the field of view, its fiery path is broken at measured intervals. This gives an indication of speed and deceleration. One such thermometer is located at Harvard Observatory in Cambridge, while the other is at Harvard's Oak Ridge station, 24 miles away.

Science News Letter, September 30, 1939

METALLURGY

Rustless Steel Effective At Very High Temperatures

HOT steel news from England: Rustless steels have been produced which maintain a reasonably protective film at temperatures in excess of 1,000 degrees Centigrade and at the same time have useful strength. This will be important to the chemical industry. Dr. W. H. Hatfield, director of the Brown-Firth Research Laboratories, Sheffield, reports this accomplished by modifying the chromium and nickel in steel compositions and also by adding other elements, such as tungsten, molybdenum, cobalt and titanium.

Science News Letter, September 30, 1939

There are more miles of highway in Michigan than in all of China.

MEDICINE

Doctors Cure One Ailment But Report New Menace

Baby Is Saved From Influenzal Meningitis With Drug; Worker on False Teeth Develops Silico-Tuberculosis

SUCCESS in treating one ailment and the discovery of a new industrial health menace are reported to the American Medical Association.

A two-year-old baby girl suffering with influenzal meningitis recovered after treatment with sulfapyridine, widely hailed for its pneumonia-curing properties. Influenza itself has so far failed to yield to either this drug or related chemicals such as sulfanilamide.

"We knew of no published report of this type of meningitis in which treatment with sulfapyridine had been successful, but it seemed advisable to try it," Drs. Tom R. Hamilton and Frank C. Neff, of the University of Kansas Hospitals, state in their report.

Other types of meningitis have been successfully treated with sulfanilamide and there was no other specific remedy to try. The little girl, arriving at the hospital after a 100-mile ambulance trip from her home in Waverly, Kans., in a prostrated condition with high fever and other dangerous symptoms, was much better after four days of sulfapyridine treatment. After a week she was well enough to go home and recovered completely within 16 days after the start of her illness.

The new industrial menace, reported by Dr. Louis Siltzbach, of New York City, is the danger of silicosis, the lung disease that threatens workers in "dusty trades," attacking dental technicians who polish false teeth with pumice or the substitute known as "pummy."

A young Russian Jewish immigrant paid with his life for this knowledge which may save thousands of his fellows who polish with pumice or "pummy" from a similar fate. For 19 years, from the time he left school at the age of 16, he worked at polishing dentures in a dental laboratory. Because of the large

HOW THEY GROW

Even the deer hunter seldom witnesses the whole cycle of antler growth during the summer months. From W. N. Dirks, amateur naturalist of Oakland, Calif., come these pictures which show how rapidly the growth takes place. On April 15, pedicles arose on the frontal bone of the deer and the summits of these pedicles became filled with a network of blood vessels, and a bony secretion became deposited (left). The other two pictures were taken on May 5 and May 25.

LATER STAGES

Late summer brings changes to the antlers. During the growth, the antler is covered with a soft, hairy skin, known as the velvet, through which run a number of blood vessels. Near the end of the antler's growth (right) a bony ring is deposited near the base which tends to cut off the blood supply. When the blood supply ceases, the deer loses or rubs off the velvet, exposing the antler, whose wrinkled, corrugated surface marks the grooves in which the blood vessels occurred. These pictures were taken on June 24, July 14, and August 25.

volume of work turned out by this laboratory, he was required to polish as many as 50 sets of false teeth in an eight-hour day. He worked in an alcove 30 feet from the nearest window, and there was no suction device or other means of drawing off the rising dust. His nose and throat were constantly irritated by it although he took "crude" precautions to protect himself, such as wrapping a wet towel over his nose and mouth or trying to wear a primitive rubber mask. He died of silico-tuberculosis.

Only one other report of danger of silicosis from working with pumice has appeared, Dr. Siltzbach found. This was a report of silicosis among pumice mill workers on the Lipari Islands, source of 90% of the pumice imported into the United States.

The New York State Department of Labor is planning to survey conditions in mechanical dentistry to find how widespread the danger of silicosis may be among workers in that industry. For the present, substitution of some harmless polishing material is recommended, together with use of exhaust hoods.

Science News Letter, September 30, 1939

CHEMISTRY—MEDICINE

Difference in Cancer Cells Confirmed by Americans

Discovery Originally Made at University of Utrecht Is Now Confirmed at Yale and Franklin Institute

DISCOVERY of an important chemical difference between cancer cells and normal ones, hailed at its first announcement in the typically cautious scientific "important if true" attitude, has just been confirmed by a member of the National Cancer Institute staff, Dr. Julius White. (*See SNL*, July 29.)

The original discovery, made by Prof. F. Kögl and Dr. H. Erxleben, of the University of Utrecht, was that one of the protein building blocks of cancer cells is slightly but significantly different from those in normal cells. These building blocks, known as amino acids, occur naturally in what might be called a left-handed form, because when a beam of polarized light is passed through them, they turn it to the left. In cancer cells, it was discovered, one of these building blocks, glutamic acid, occurs both as the natural left-handed acid and in an unnatural right-handed form that turns polarized light to the right.

The discovery may speed the fight against cancer by giving a possible chemical approach to better understanding and treatment of this malignant disease. Before its possibilities in this direction could be explored, however, the original discovery had to be checked by independent groups of scientists to make sure there was no mistake about it.

Dr. White, working with Florence White, his wife, at Yale University, is the third American to report that he has confirmed the Kögl-Erxleben discovery. The Whites' report has just appeared (*Journal of Biological Chemistry*).

First confirmation of the discovery, so far as is known, was made by Dr. E. Schroeder, working at the Biochemical Research Foundation of the Franklin Institute.

Second confirmation, (*Science*, Sept. 15) the day before the Whites' report appeared, was made by Drs. L. Earle Arnow and Jeanette C. Opsahl at the University of Minnesota Medical School.

Failure to confirm the discovery, reported by Dr. A. C. Chibnall and associates in London, has been explained by Prof. Kögl as due to a difference in chemical methods.

Science News Letter, September 30, 1939

Magnesium, lighter than aluminum, is obtained from brine wells and sea water.

GENERAL SCIENCE

Can Civilization Survive Another World War?

Scientists Writing or Speaking Before the Guns Boomed Expressed Pessimism; Fear Progress May Be Doomed

By WATSON DAVIS

WITH a major war raging, the great question before the world is:

"Can civilization survive another world war?"

Can civilization's brain, which is its science and accumulated knowledge, remain essentially unimpaired and capable of carrying on? Will civilization's body, composed of the millions of men, women and children in the world, escape irremediable wounds that would be visited upon future generations?

The great scientific minds have pondered these questions as the stage for the second Great War was being set with bombs, guns, black-outs, flying death and distorted mentalities. Uninfluenced by the actual beginnings of hostilities, scientists in various fields have attempted to predict what war in the frightful modern manner would mean to the better way of living on earth fashioned during the long centuries of men's evolution up from the beast.

Frank pessimism rules these opinions of scientific leaders.

"The peoples of all countries, including the dictatorships, are coming more and more to the realization that another war can bring only death and destruction to everybody—the end of civilization, not the world domination which the demagogic leader promises," said Dr. Robert Andrews Millikan, American Nobelist in physics.

Another Nobelist, Dr. Harold C. Urey, Columbia University chemist, has said that "chemistry can and perhaps will destroy our European civilization."

Mass Suicide

Man in his blind march to possible destruction has been compared to the little lemmings, the Arctic animals which commit mass suicide by millions when the ocean interferes with their mass movement.

"One scarcely envisages mankind marching to a watery grave just behind a horde of frantic lemmings," Dr. Raymond Pearl, the Johns Hopkins University biologist, has remarked, adding: "But does anyone find it difficult to conceive of man marching off in the not too distant future to a war? Or to doubt that once well started that war will entangle in its meshes the major portion before it is finished?"

That brilliant British biologist, Prof. J. B. S. Haldane, wrote over a decade ago in "Possible Worlds" that even if man does not perish, there is no reason why civilization should not do so.

Complicated Invention

"All civilization goes back to a common source less than 10,000 years ago, very probably in Egypt," said Prof. Haldane. "It is a highly complicated invention which has probably been made only once. If it perished it might never be made again. . . . A modern war followed by revolutions might destroy it all over the planet. If the weapons are as much improved in the next century as in the last, this will probably happen.

"But unless atomic energy can be tapped . . . we know that it will never be possible to box up very much more rapidly available energy in a given place, than we can already box up in a high explosive shell, nor has any vapour much more poisonous than 'mustard gas' been discovered in the forty-one years that have elapsed since that substance was first produced. I think therefore that the odds are slightly against a catastrophic end of civilization."

Dr. Lancelot Hogben, British scientist and author, wrote only last year:

"If the chemist devotes his ingenuity to making gases and sprays to blind and suffocate the inhabitants of great cities, and bacteriologists consent to spread plagues to infect the reservoirs and stock of enemy populations, the survivors of our civilization will declare that our science has exacted too high a price for its benefits. Even if science and civilization do not perish together, both will suffer a heavy setback for many years to come."

The possibility that the United States is the only hope for civilization's survival was expressed as long ago as 1931 by Bertrand Russell in his book, "The Scientific Outlook."

"It may be that a scientific civilization will be found essentially unstable," he wrote then. "There are several reasons which make this a not unplausible view. The most obvious of these is war. It happens that recent innovations in the art of war have increased the power of the attack much more than the power of defence, and there seems no likelihood that the arts of defence will be able to recover the lost ground before the next great war.

"There are those who say that in the next great war nobody will be allowed to be neutral. If that is so, the only hope for the survival of civilization is that some one nation will be sufficiently remote from the theatre of operations and sufficiently strong to emerge with its social structure undestroyed. The United States has the best chance of occupying this position."

While others shudder at war's destruction of human life and cities, the psychologists and psychiatrists point to more hidden damage which may be even more serious. Not long ago the Society for the Psychological Study of Social Issues in a statement declared:

"The damages of war are tremendous. We, as psychologists, note particularly the great increase in numbers of mental breakdowns, the ruin of many personalities through shocks and strains, the irremediable harm done to those who are mangled and disfigured, the devastation of economic depressions which follow war—these alone are sufficient, we think, to overbalance any conceivable benefits from war.

Loss of Human Values

"But we must add to these the great loss of human values, the destruction of our moral standards, which are an inevitable part of war. We spend years teaching our children the sanctity of human life, the rights of other people to freedom of action, possession of property, etc. We punish violators severely. But, as soon as war is declared, we tell young men to kill, maim and hurt other men; to destroy homes and lay waste cities; to bomb and gas women and children. Such actions inevitably leave their marks on the characters of these men. Indeed, we know from the post-war years that such damage to personalities was done, and that it can never be completely undone."

Dr. William A. White, pioneer psychiatrist and for many years superintendent of St. Elizabeth's Hospital in

Washington, said just a month before he died in 1937:

"Nothing activates the aggressive instinct more seriously than does war. An orgy of killing lets it loose and it is a good many years before it is ever chained up again."

Many scientists feel that they must take an active part in everyday affairs to protect civilization against the dangers of war. They will agree with Dr. Franklin Fearing, University of California psychologist, who said that psychologists "must step in to control and suppress war propaganda or they will be destroyed. Psychologists cannot afford to leave political and social matters to the non-scientists. The psychologist who must dance to the tune called by politician or industrialist is no more than a serf. That is the condition of many scientists even today."

Scientists are often blamed for their part in making war more horrible as it is made more scientific. New knowledge and inventions add to the frightfulness and destruction of war. To these charges the reply is that war's utilization is a mere accidental by-product of scientific research and invention. The scientist alone can not be expected to control the misuse of his gifts to civilization any more than the cutlery manufacturer can prevent a murder being committed with a butcher knife he makes. But intelligent mankind should be able to prevent civilization from committing suicide with the butcher knife of scientific advancement.

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PRIMITIVE

Man rose from the cave, and the new war promises to send him back there, perhaps figuratively in loss of culture as well as literally in his air raid shelters. Psychiatrists point out that the man in the gas mask has aggressive and destructive impulses unleashed by war that are as primitive and uncontrollable as those of his stone age forebears. The photograph of the cave man is of an exhibit in the Field Museum of Natural History, Chicago.

AGRICULTURE

Wilt-Resistant Alfalfas To Be Ready in 1942

WILT-RESISTANT alfalfa varieties, developed under a long-range breeding program by the U. S. Department of Agriculture, will be available to limited distribution in 1942.

The new alfalfas are being produced by crossing resistant strains, brought from Turkistan by H. L. Westover, with varieties already established in the United States.

Alfalfa wilt began to become a serious problem in this country about 15 years ago. Up to that time, a good stand of alfalfa could be counted on to last from 6 to 12 years without reseeding, but lately the wilt organism has been wiping out alfalfa fields in from 2 to 4 years.

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PHYSICS

Beams Of Neutrons Produced By Hole Through Water Wall

Discovery Expected To Be of Great Aid in Study of Transmutation of Matter and Artificial Disintegration

BEAMS of piercing neutron particles are now being produced at the department of physics at Cornell University in an experimental advance which will be of great aid to all scientists studying the transmutation of matter, artificial disintegration, and other tricks of the atom smashers' art.

Prof. R. F. Bacher of Cornell and Dr. D. C. Swanson, now at the University of Florida, report in the *Physical Review* (Sept. 1) that by placing a thick wall of water around a source of neutrons and then putting a "hole" through the water by means of a tube they have achieved a distinct collimation of their neutrons into a beam.

Neutrons, because they lack electrical charge, easily penetrate into any atoms with which they come in contact. Previous attempts to produce a beam of them have only been partially successful. And yet such beams have been greatly needed to improve the geometry of many nuclear experiments in which scattering occurs and cross sections of atoms for neutrons of different energies can be determined.

Many of the experiments in nuclear physics require well defined beams of particles just as spectroscopy requires well defined beams of light rays. Much of the early work in nuclear physics, for it has really been in quite a primitive stage of development, was done in experiments that in spectroscopy would have been equivalent to working with very coarse slits in a spectrograph.

The new beam technique of Prof. Bacher and Dr. Swanson does not yet attain perfect results in producing a true, collimated beam but it does produce much better results than hitherto.

Science News Letter, September 30, 1939

MEDICINE

Sewage Tests Give Lead In Infantile Paralysis War

A NEW lead for the attack on the still unsolved problem of how infantile paralysis spreads from one patient to another appears in a report by Drs. John R. Paul, James D. Trask and C. S. Culotta, of Yale University. (*Science*, Sept. 15)

During the epidemic in Charleston, S. C., this spring, the Yale investigators discovered infantile paralysis virus in the sewage in that part of the city where most of the patients were concentrated. This is the first time infantile paralysis virus has been found in sewage, although evidence has accumulated within the past two years suggesting that the virus might get into sewage systems in the same way that typhoid fever germs can get there.

The discovery may mean that sewage is a link in the chain which leads infantile paralysis from one patient to another. The Yale investigators state that their work does not show whether this is the case or not.

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PUBLIC HEALTH

Teach Night Driving To Reduce Accidents

MOTORISTS when first learning to drive an automobile should be given some of their instruction in driving at night, the American Medical Association suggests. The fatal motor accident rate at night, on the basis of traffic, is more than three times the accident rate during daylight, it is stated.

Night driving involves a different technic from day driving because of the difference in visibility and in the reactions of the driver. The hazard of falling asleep at the wheel is naturally greater at night, and even if the driver does not actually fall asleep he is likely to be more tired and less alert than during the daytime hours. The menace of the drunken driver is also greater at night, it appears. A report of the National Safety Council shows that more than three-fourths of the accidents in which the driver had been drinking occurred between 6 p.m. and 6 a.m.

Besides being responsible for his own condition, and for his skill in driving at night, the driver is responsible for the condition of his car. Headlights, it should be remembered, lose as much as half of their effectiveness in a short time unless they are kept clean and adjusted.

On the matter of speed, drivers are advised that they should lower their speed at night in order to keep their safe stopping distance within the range of clear visibility.

The pedestrian also has some responsibility in night motor accidents. Too many pedestrians make the mistake of thinking that because they can see the headlights on the automobile, the driver can see the pedestrians. This is not necessarily the case. Pedestrians are urged, for their own safety, to wear light clothing and to carry a light when walking on the roads in rural districts at night. Even carrying a white handkerchief would help considerably to make them visible to the approaching motorist.

Highway officials are responsible for the design and maintenance of the roads and also for installing adequate signs and warnings designed for good visibility at night. The Safety Council suggests that they consider installation of good illumination of heavily travelled and dangerous main roads and floodlighting of railroad crossings, intersections and other special danger zones.

Science News Letter, September 30, 1939

MEDICINE

War On Infantile Paralysis May Be Advanced By Rats

RATS promise to allow the search for a cure or preventive of infantile paralysis (poliomyelitis) to go ahead at full speed regardless of war or financial considerations.

Dr. Charles Armstrong of the U. S. Public Health Service has succeeded in giving the disease to rats. Before this latest accomplishment at the National Institute of Health, scientists trying to control poliomyelitis had only monkeys and children as guinea pigs for trial of new preventives or treatments. No other animals but monkeys and humans were known to contract the disease.

Monkeys, the standard animal for poliomyelitis research, are costly, both to acquire and to keep. At present the purchase price is about $10 per monkey, but it is expected to rise as war interferes with importation of the animals. The price of a rat, on the other hand, runs around 60 cents and is not expected to fluctuate because of war.

The infantile paralysis virus has now been carried through seven transfers in the Eastern cotton rat. More studies are needed, Dr. Armstrong said, to determine how susceptible this animal is to the disease, before much can be said about how valuable the rat may be in speeding the infantile paralysis fight.

Science News Letter, September 30, 1939

IN SCIENC

PSYCHOLOGY

Monkeys Could Use Tools Long Before the Apes

LONG before man evolved, or even the higher apes, such as chimpanzee, gorilla or orang-utan, arose in the long millenia of biological development, tools were being used. You don't have to be a man to use tools, monkeys can use them with relatively high intelligence and even insight. Dr. Carl J. Warden, Columbia University associate professor of psychology, has completed tests on Old and New World monkeys with food as the incentive that causes the animals to use their brains and hands intelligently.

A tempting morsel was placed outside the cage out of arm's reach. Nearby was a rake that could be used to hook it, a simple problem almost too easy. It was more difficult when the nearby rake was too short but could reach a longer rake outside another side of the cage and this rake could reach the food. This required brain and hand work.

Some monkeys would use up to eight progressively longer rakes to reach food. This takes thinking through a problem, what psychologists call insight.

Significant fact: Chimpanzees, and presumably men, without frontal lobe of their brains, cannot solve such problems. With animals so deprived, out of sight is out of mind.

Observes Dr. Warden:

"Failure to get the food caused some of the monkeys to act very much like spoiled children. When the problem became too difficult for some of them to solve they flew into a tantrum, kicking their feet, biting the rakes and tearing their hair. On the other hand success often made them eager to continue using the tools. A difference between the abilities and temperaments of the individual monkeys was distinctly noticeable."

Interesting speculation: If man had evolved from New World stock instead of from the same lower animals as Old World monkeys and higher apes, he might be more intelligent. Dr. Warden found that the New World monkeys learned "far more quickly than those from the Old World."

Science News Letter, September 30, 1939

NCE FIELDS

PUBLIC HEALTH

Unstable Societies Suffer From Ulcers, Coronary Ills

THOUGHTS for our rushing daily life from Prof. L. J. Henderson, Harvard chemist-physiologist, contained in his paper before the Fifth International Congress for the Unity of Science:

When societies are too unstable, individuals suffer. Disease of the coronary arteries, gastric ulcer and duodenal ulcer are most frequent in unstable societies. An index formed by adding appropriate measures of the incidence of these diseases and of divorce, and subtracting a measure of attendance at church, might sometimes run more or less parallel with an index of industrial development.

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ZOOLOGY

Worms Have Own Rules For Growing New Heads

CUT AN angleworm in two and what do you have?

Two worms, says the common or garden variety of natural-history observation. Two worms—maybe, says science.

The head-end half of a bisected angleworm usually grows a new tail-end, but the tail-end half can grow a new head only under certain conditions, states Dr. Libbie H. Hyman of the American Museum of Natural History. Dr. Libbie has bisected many more worms than most of us do, and what is more has kept them under close observation afterwards, which the rest of us don't bother to do.

Growing a new tail on the head-end half is no trick for a worm. Even without bisection, worms are constantly adding to their stature (horizontally) by growing new segments in the after part of their bodies, just forward of the rearmost segment. So when they are chopped in two, whether accidentally or on purpose, all the front half needs do is continue the natural order of things.

Growing a new head-end on the amputated tailward half is more of a job. It might not seem so to a superficial observer, who can see no more head or tail to an angleworm than there is to a piece of boiled spaghetti. But despite appearances an angleworm does have a head—enough to provide a local habitation for that all-necessary organ, the mouth, and to accommodate the simple brain that suffices for an angleworm's needs.

The head-forming potential in an angleworm seems to be tied up very closely with its nervous anatomy, which consists principally of a double chain of nervous tissue running along the underside of its body. The farther forward the cut is made the easier it is for the decapitated annelid to re-capitate itself, for the forward end is in head-dominated territory, speaking in terms of the animal's body polarity. If the cut is made so far aft as to be in tail-dominated territory, no new head can be formed.

Strangest of all, if partial cuts are made, severing the nerve-chain at several points in the head-dominated part, a new head will crop out at each incision. Thus science has taken the old Hercules-and-Hydra story and gone it one better.

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PSYCHOLOGY

U. S. Starts Program Of Psychological Research

MORE than $100,000 will be spent by Uncle Sam in psychological research in connection with the civil aviation training program.

This is believed to be the only fund set aside specifically for research in this field since World War days, when the Army intelligence test was developed by the nation's leading psychologists working cooperatively.

The new fund will be devoted mainly to improving methods of training although an attempt will also be made to develop aptitude tests for the best selection of young men naturally fitted to become good flyers, Dr. Dean R. Brimhall, of the Civil Aeronautics Authority, psychologist who is guiding the program, told a Science Service representative.

Universities all over the country will be asked to cooperate, he said, and the actual research work will be done in the university laboratories. It is hoped by this plan to secure the cooperation of the best minds in the field of occupational and educational psychology.

This is also a new departure, for the scientific research conducted by the United States Government has in the past usually been done only in Government laboratories or by Government scientists.

Aid has been asked of the National Research Council in selecting psychologists for cooperation.

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PHYSICS

"Sound Your A" Is Out Now It's On the Air

SWING bands may be guilty of every other felony in the musical calendar, but there's no excuse any longer for their being out of tune—or for more highbrow musicians, either, for that matter. Never again will it be necessary for one tuning-up performer to ask another to "sound your A, please." Uncle Sam is doing that all the time, now, through the National Bureau of Standards.

Station WWV, Beltsville, Md., with a frequency of five megacycles, is now keeping continuously on the air the musical tone of A above middle C, or 440 cycles per second. This is interrupted only during the short periods of other Bureau of Standards broadcasts on the same radio carrier frequency. To insure identification of the station, the call letters WWV are given every ten minutes both by voice and in telegraphic code.

The accuracy of the 440-cycle standard pitch as transmitted is better than one part in ten million, which is far beyond any musical requirement.

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PHYSICS

Polaroid Lenses Can Be Ground to Prescription

BETTER protection against sun glare while driving is promised by the latest development in the use of polarized light, eyeglasses with polaroid lenses ground to the proper oculist's prescription to correct defective vision.

Thousands of billions of little crystals per square inch imbedded in cellulose plastic, each standing parallel to the others like well-drilled soldiers, pass through polaroid's glare defense lines only light vibrating in one plane. Such anti-glare glasses with plain lenses have been available for several years, four-eyed drivers wearing two pairs of glasses and thus becoming six-eyed to blot out the high-lights and shine. It took American Optical Company five years to perfect sandwiching the anti-glare stuff (much as auto safety glass is manufactured) between optical glass that can be shaped like ordinary glass lenses. The future: How soon will auto manufacturers get together and put polaroid in all headlights and windshields to end the menace of headlight glare on highways? That is a method successful only if all cars are so equipped.

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ASTRONOMY

Lunar Eclipse

Although Not Quite Total, It Will Be So Near It That You May Not Notice the Difference; On October 27

By JAMES STOKLEY

MOST interesting of events scheduled in the heavens for the month of October, and visible from the United States, is an eclipse of the moon during the night of Friday, October 27. Though not actually total, it will be hard to tell that it is not. Reminding one of the purity of a certain brand of soap, it will be 99.2% total! That is, 99.2% of the diameter of the moon will be in the shadow of the earth, and the .8% remaining out will scarcely be noticed.

In Eastern Standard Time, the first noticeable effect will come about 11:54 p. m., when the northeastern edge of the moon touches the earth's shadow. At 1:36 a. m. the eclipse will be at its height, and the moon will have the red color of the light which is bent around the earth by its atmosphere and into the shadow. The eclipse will be over at 3:18 a. m., when the moon's western edge makes last contact with the shadow.

As in recent months, the planets are making a fine display, and they are indicated on the accompanying maps. Here the skies are shown as they appear at approximately 10:00 p. m. October 1, 9:00 p. m. on the 15th, and 8:00 p. m. on the 31st. Jupiter, high in the south, in Pisces, the fishes, is the most brilliant, of magnitude minus 2.4 in the astronomer's scale. Mars, lower and farther west, in the figure of Capricornus, the sea-goat, is red in color and considerably fainter, though it still exceeds in brilliance any of the stars. Saturn, toward the east, and also in Pisces, is faintest of the three. The other two planets that sometimes are visible to the unaided eye, Venus and Mercury, are both too close to the sun's direction to be visible.

Brightest Is Vega

Among the stars, which are distant suns, the brightest is Vega, toward the northwest, and marking Lyra, the lyre. Above is Cygnus, the swan, with Deneb. To the left, one sees Altair, of Aquila, the eagle. High in the south are the four stars of the "Great Square of Pegasus," so called despite the fact that the one in the upper left, Alpheratz, is in the constellation of Andromeda. Low in the south is Fomalhaut, in Piscis Austrinus, the southern fish, one of the most southernly bright stars visible from these latitudes.

To the northeast we see two of the bright stars which will shine prominently in the southern sky of winter. These are Capella, in Auriga, the charioteer, and Aldebaran, of Taurus, the bull. The "Great Dipper," of Ursa Major, the great bear, is low in the north, its poorest position of the year, but higher is the W-shaped group of Cassiopeia, the queen, now in a very good position. This is above Polaris the pole star. To the left of Ursa Minor, the little bear, of which the pole star is part, winds the fainter constellation of Draco, the dragon.

Solar Eclipse, Too

The moon eclipse on October 27 is not the only eclipse of the month, but it is the only one that will be observed by very many people. On October 12 the moon's shadow will sweep across the earth, producing a total eclipse of the sun. For about a minute and a half, at the maximum, the sun will be hidden. Astronomers often make trips of thousands of miles to see such an eclipse, but in this case they would have to be Antarctic explorers as well, for the path over which the total eclipse will appear passes over Antarctica, close to the South Pole. Even there it is low in the sky, and probably no human being will see it.

Over a larger area, however, the eclipse will be partial, with the dark lunar disc partly hiding the sun. The area where this will happen includes the southern tip of South America, New Zealand, and a large part of the southern Pacific Ocean.

An eclipse of the sun is only visible as total over the narrow area touched by the moon's tapering shadow, but one of the moon can be seen wherever the moon is in the sky during the phenomenon, including more than half of the earth.

Begins in Europe

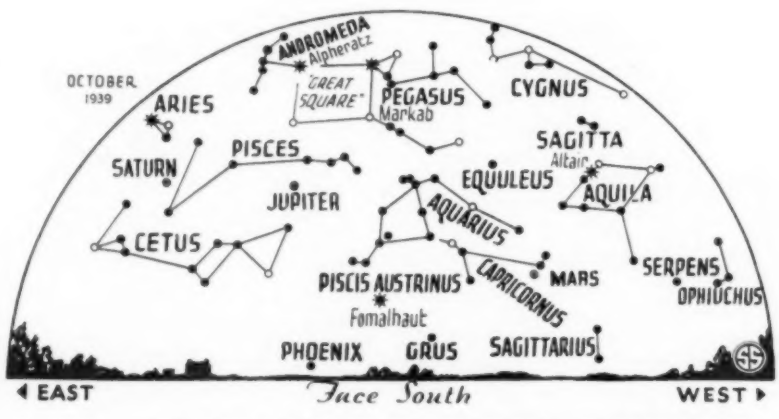
The beginning of the eclipse on the 27th will be viewed in most of Europe, except the most eastern part, in western Africa, the Atlantic Ocean, North and South America, the eastern part of the Pacific Ocean, and northeastern Siberia.

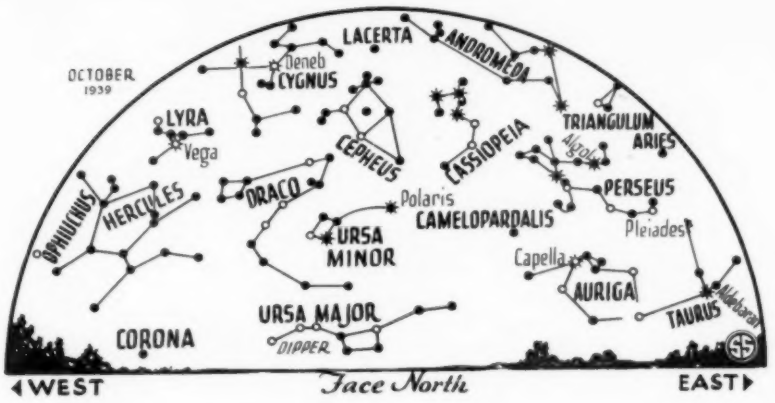
By the time the eclipse is ending, the earth will have turned, and it will then be apparent over the North Atlantic and Arctic Oceans, North and South America, the Pacific Ocean, Polynesia, the eastern part of Australia and northeastern Asia.

This is the only eclipse of the moon visible this year in the United States, though there was one on May 3 seen from Asia, Africa and part of Europe.

Compared to an eclipse of the sun, one of the moon is relatively unimportant from a scientific viewpoint, though it has some useful aspects. For one thing, it permits a more accurate check of the moon's position in the sky.

Because it is affected by the gravitational pull not only of the earth, but of all the other bodies in the solar sys-





tem, the precise prediction of the moon's motion is a very complicated problem. Therefore it has to be checked by occultations, that is, the hiding by the moon of stars in the distant background. Their position is well determined, the time of an occultation can be predicted, and if it does not happen on schedule, the difference, always very small, is a result of inaccuracy of the moon's own motion.

The moon cannot be eclipsed unless it is on the side of the earth away from the sun, that is at full moon, for that is the direction in which the earth's shadow extends. Ordinarily at full moon, our satellite is so brilliant that it is difficult to observe these occultations, especially of fainter stars, but the eclipse dims it so much that they can then be made.

A lunar eclipse is very interesting to watch, especially as the curved shadow of the earth crosses the moon's surface. This, incidentally, is an excellent proof of the roundness of the earth, and was so recognized in early days. The shadow is always the arc of a circle. Nothing but a sphere, of course, can always cast a round shadow.

The red color of the eclipsed moon is caused by the refraction, or bending, of the light of the sun by our atmosphere. Without it, the shadow would be sharply defined, but with it, the sunlight that grazes the earth is bent into the shadow and falls upon the moon, even when fully shaded. As this light passes through the air, blue rays are scattered, and this gives the daytime sky its blue color. Deprived of the blue, the light that emerges is predominantly red, and the moon, in eclipse, takes on a ruddy, coppery color that used to strike terror into the hearts of primitive men when they saw it.

Celestial Time Table for October

Friday, Oct. 6, 12:27 a. m., Moon at last quarter. **Tuesday, Oct. 10,** 8:00 p. m., Moon nearest earth — 224,700 miles. **Thursday, Oct. 12,** Total eclipse of sun; 3:30 p. m., New moon. **Thursday, Oct. 19,** 10:24 p. m., Moon at first quarter; Orionid meteors. **Saturday, Oct. 21,** 1:09 p. m., Moon passes Mars; 10:00 p. m., Saturn nearest earth—distance 771,900,000 miles. **Sunday, Oct. 22,** 6:00 p. m., Moon farthest from earth—distance 251,600 miles. **Wednesday, Oct. 25,** 11:42 a. m., Moon passes Jupiter. **Friday, Oct. 27,** 3:09 p. m., Moon passes Saturn. **Saturday, Oct. 28,** Early morn, Eclipse of moon; 1:42 a. m., Full moon.

Eastern Standard Time throughout.

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GEOGRAPHY

Rumania Has Grain, Wood, Richest Oil Fields in Europe

RUMANIA, mentioned as "next" for the Nazi razor of conquest, would be an especially juicy bit from the German point of view. Not only does the country contain the richest oil fields in Europe and some of the greatest grain and timber production areas, but within its present boundaries are three big blocks of real estate that might be used as bribes for the winning of three nations as yet in the neutral list but commonly credited with leanings in the Nazi direction.

First and largest is Transylvania, comprising something like a third of Rumania's total area. Before the First World War it was part of Hungary, its boundary running along the crest of the Transylvanian Alps which now form the backbone of the Rumanian kingdom.

Transfer of this rough and mountainous province to Rumania by postwar treaty cut Hungary in half and swelled the shape of Rumania from a prewar kidney-bean to a postwar round cookie. Hungary has been very sore about the loss of Transylvania and probably could be easily induced to join the Nazis if return of this lost province were held out as an inducement.

Second possible bribe-slice would be Bessarabia, a wedge-shaped stretch of lowland between the Pruth and the Dniester rivers, its coastline coming down to the mouths of the Danube. Rumania took this away from Russia during the latter country's period of revolutionary disorganization. Russia would undoubtedly be glad to get Bessarabia back again, along with the formerly Russian parts of Poland.

Bulgaria Hopes

Finally, there is the stretch of coastal land south of the mouths of the Danube, known as the Dobrudja. This was part of Rumania before the First World War, but Bulgaria has always had a covetous eye on the province. Hope of getting it was one of the considerations that brought Bulgaria in on the side of Imperial Germany, and the same hope might bring her in again as an ally of Nazi Germany.

A military venture against Rumania would be psychologically easy to "sell" to the Germans. Rumanian troops have always been regarded as "soft"; and it is true that when Rumania entered the First World War on the side of the Allies she was promptly knocked out in one sweeping campaign under the ruthless Mackensen.

They might be disappointed in one respect, however. Undoubtedly, the hope of getting full command of Rumanian oil would be a prime motive for a German invasion. However, it is known that the present leaders in Rumania, who were young soldiers when their country had to suffer humiliating defeat twenty years ago, would ruin their oil wells with dynamite and fire rather than see them fall into the hands of a hated enemy.

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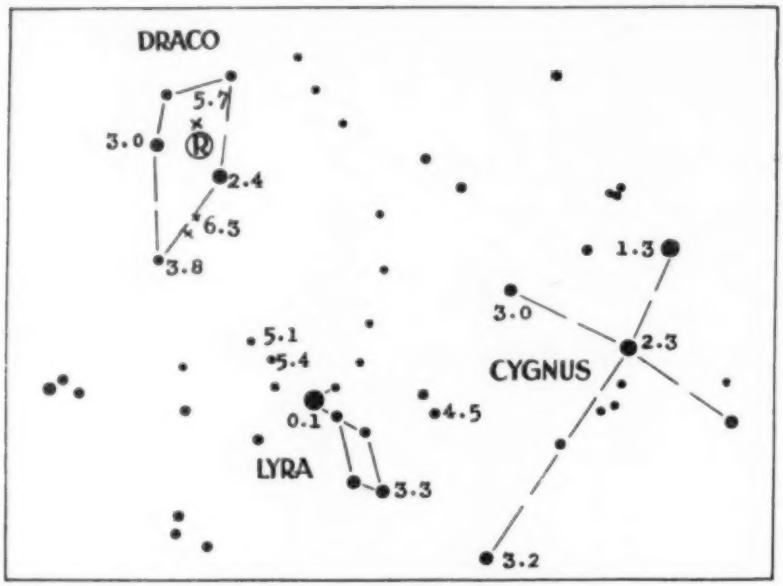
● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Friday, Sept. 22, 4:27.4 p.m., EST

Near eastern coast of Lower California. Latitude 30 degrees north, longitude 114 degrees west. Rather sharp shock.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL, June 17.



SHOOTING STARS EXPECTED

The part of the sky where the meteors of Oct. 9 or 10 can best be seen. Locate these stars and determine the faintest of them that you can see. Figures indicate the magnitudes of star brightness. R indicates the region of the sky from which the meteors appear to come.

ASTRONOMY

Astronomers Expect Shower Of Meteors on October 9-10

ASTRONOMERS are hoping for an extraordinary display of shooting stars or meteors on Oct. 9 or 10, although they are trying not to raise anticipation too much by making definite predictions.

Just six years ago, Oct. 9, 1933, there was visible in Europe for a few hours the strongest meteor shower of this century. It was one of those heavenly performances that one is lucky to see once in a lifetime. Astronomers figured out that the earth had passed through the region of space occupied 80 days previously by the faint, short-period comet Giacobini-Zinner. The meteors were produced by bits of debris tagging along in the same orbit as the comet.

Since the period of this comet is 6.6 years, it is again due back in the vicinity of the earth. This year the earth precedes the comet to the point where their paths cross by 136 days. In 1940 the earth follows the comet by 229 days. In either case there is a chance that there will be a recurrence of the Giacobinid meteor shower.

Dr. Fletcher Watson of Harvard Observatory finds that the earth reaches a favorable position for a shower on Oct. 9 or 10, if the comet has not varied too much from its previous path, which it may have done. He suggests that observers over the whole earth be alert during those evenings so that any display of meteors can be properly recorded for science.

Any careful, observant person can make useful records. Here is how to go about it. Get out in the country where street and house light will not blind you for the majority of the meteors will be faint. Record the magnitude or identity of the faintest star you can see. If the transparency of the sky changes appreciably during the observations, record the changes.

Watch some definite region of the sky, such as the polar region or the zenith, directly overhead. Count the number of meteors seen during intervals of five minutes. At least once each hour, over intervals of not less than five minutes, count the number of meteors of each magnitude. Determine as closely as possible the position and size of the area from which the meteors seem to come. If low-power binoculars are available make observations of the number of meteors of various magnitudes seen through them. Send in a full record of your observations to the SCIENCE NEWS LETTER, Washington, D. C., for transmission to astronomers who will study them.

An extraordinary display of the Giacobinid meteors may occur in 1946 because then the earth and the comet are expected to be only 8 days apart in reaching the same position. But astronomy has not yet lived down the failure of a much-heralded Leonid shower in 1899, which just didn't happen. For that reason, while hopeful, astronomers are not being dogmatic about the chances of seeing the Giacobinid shooting star shower, either this year, next or in 1946.

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MEDICINE

Thin Films "Guinea Pigs" In Study of Immunity

INVISIBLE FILMS, some a single molecule thin, are being used as "guinea pigs" in one of the latest attacks upon disease secrets conducted at the Rockefeller Institute for Medical Research by Dr. A. Rothen and Dr. K. Landsteiner, Nobelist in medicine for his discovery of the blood groups fundamental to blood transfusions.

Using the method of making thin films practiced by another Nobel prize winner, Dr. Irving Langmuir, the Rockefeller scientists are using one-molecule-thin layers of egg white or albumen and similar layers of blood serum to learn more about immunity to disease.

Such molecular films can be formed on the surface of water and then transferred to plates. One film can be laid on another to determine reactions between them. Similar films of different substances produce layers that make glass almost invisible by suppressing reflections.

Immunity to germ diseases depends, scientists believe, on the development in the blood of substances called antibodies which are produced when antigens from invading germs get into the body. The antibodies are usually specific, appearing in response to the antigens of specific germs, one kind mobilizing to fight diphtheria germs, another kind to fight pneumonia germs, and so on.

This specificity of antigens and antibodies depends on chemical architecture, it is suggested by these Rockefeller studies with single molecule layers. (*Science*, July 21)

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PSYCHIATRY

In Freud's Death World Loses A Pioneer in Science of Mind

Colleagues Liken Father of Psychoanalysis to Copernicus and Newton; Say He Paved Way for Peace

Sigmund Freud died on September 23, an exile near London from his home in Vienna. These evaluations of his work were written by fellow scientists in the United States at the request of Science Service.

By DR. A. A. BRILL
Psychiatrist, New York City

WITH the death of Sigmund Freud the world has lost one of its outstanding figures and science one of its most ardent votaries.

Prof. Freud was not merely a pioneer in the mental sciences but the discoverer and developer of a new method of investigation of mental processes. Psychoanalysis is his own creation. Before he came on the scene no one understood the underlying factors of abnormal behavior. Psychiatry was barren and uninteresting. The best achievements of his predecessors were classification and description. They told us nothing concerning the dynamic factors at the bottom of the neuroses and psychoses.

Prof. Freud not only solved the riddles of neurotic symptoms, hallucinations, and delusions but bridged the seemingly long gap between the psychically normal and abnormal, by demonstrating the same mechanisms in dreams, myths, fairytales and totemism.

Through incessant toiling for almost sixty years Freud developed a most rational and most adequate method of study and treatment of mental diseases. Through his concepts one can follow the intricacies of the psyche into normal or abnormal paths of behavior as never before.

In brief, Prof. Freud has rewritten the mental sciences and has given new life to psychology, sociology, anthropology and literature. His theories have encountered strong opposition from the very beginning but most of this has long vanished. For some years the scientific world has recognized the value of his discoveries. His works are read and studied wherever there is any civilization. There are psychoanalytic societies in every part of the globe where his pupils are teaching and promulgating the words of the master.

Prof. Freud died at the ripe age of eighty-three years but the spirit of his work will live forever.

By DR. WINFRED OVERHOLSER
Superintendent, St. Elizabeth's Hospital, Washington, D. C.

THE WORK of Prof. Sigmund Freud in its long range perspective can better be evaluated a century from now than at present. There is every reason to think that one hundred years hence Freud will be classed with Copernicus and Newton as one of the men who opened up new vistas of thought. Certain it is that in our time no man has cast so much light upon the workings of the mind of man as Prof. Freud. Coming upon the scene when psychiatry and psychology were in the descriptive stage of development, Prof. Freud by strokes of genius, a profound philosophy, and scientific clinical investigation discovered the important part played by the unconscious in the mental life, the role of phantasy, of instinct and of emotion. Above all he developed the concept of psychological determinism and placed psychiatry where it properly belongs, among the biological sciences.

For reasons which are clearly understood by everyone familiar with man's vanity, his work for many years encountered tremendous opposition, just as did the enunciations of Galileo long before. This opposition indeed continues in certain circles, and the student of the mind readily appreciates the reasons why only recently Prof. Freud was expelled from his native city. In spite of the opposition, however, Freud's teachings have by their own intrinsic soundness made themselves felt and accepted, so that today no psychiatrist, whether professedly Freudian or not, is able to discuss a case without utilizing some, at least, of the Freudian concepts. It is a great satisfaction to all of the admirers of Freud to know that notwithstanding the early criticism of his work he has been permitted to live to a ripe old age in the full possession of his mental faculties and vigor, and to see the very general acceptance of his teachings, which once were so severely and unfairly attacked.

By DR. FRANZ ALEXANDER
Director, Institute for Psychoanalysis, Chicago, Ill.

A FINAL evaluation of Freud's contribution will be possible only from the perspective of history. Even the accomplishments of the greatest genius are determined by the spirit of their time, but the earmark of genius is that he gives more to his time than he receives from it. This is true in the case of Freud to the highest degree.

Freud's influence upon psychiatry was as revolutionary as that of Copernicus upon astronomy or as that of Darwin upon biology. He introduced a new principle and method of investigation to serve as the basis of a new discipline.

Psychoanalysis is the first consistent theory of personality and the first causally oriented form of psychotherapy.

Prof. Freud's main accomplishments were: to demonstrate that man's personality, normal or morbid, is shaped by life experiences, that among these experiences early childhood influences are of overwhelming significance. That already in childhood sexual desires and jealousies (oedipus complex) are important factors, and above all, that behind a layer of civilized veneer man harbors in his unconscious mind a nonsocial nucleus with destructive impulses directed against others and himself. He discovered a method by which this nonsocial core of personality can be explored in spite of man's natural tendency to hide it from himself and others.

Freud takes a leading position among those scientists who forced man to replace self-deception and superstition by recognizing the true nature of things: the natural sciences are accomplishing this by exploring the world surrounding

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us, Freud attempted it by exploring the internal world of man himself. In the present confused world man is using his advanced technical knowledge both for self-preservation and destruction. Freud's psychoanalysis, by its deeper knowledge of man's destructive impulses, may be the antidote against one sided technical development which threatens to destroy civilization. It may lead to a more constructive social life in which man, by recognizing it, will control his unconscious destructiveness and use his scientific mastery of nature for mutual help to happiness.

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ENGINEERING

Bureau of Standards Has Completed Steam Tables

IMPORTANT jobs you never hear about: Making up long tables of fine print listing thousands of figures, the steam tables familiar in engineer's handbooks based on a long and complex series of determinations of the properties of steam. U. S. Bureau of Standards research just completed covers properties of water and saturated steam from water's freezing point (32°F.) to the critical region where pressure is about 3200 pounds per square inch (705°F.)

What steel strength data is to the bridge builder, steam tables are to engineers who build giant power plants and locomotives. International cooperation, U. S., England, Germany participating, made possible the research, successfully steered by the American Society of Mechanical Engineers.

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From Page 211

reason and scientific knowledge. To keep alive the aims of science in furthering the pursuit of truth in the universe and the relation of that truth to the developments of man's nature, without regard to tribal and racial distinctions, should be, indeed, must be, the ultimate function of the scientific thinker, whatever may be his more immediate preoccupations."

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RADIO

H. S. Fairbank, of the Public Roads Administration, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, October 9, 4:30 p.m., EST, 3:30 CST, 2:30 MST, 1:30 PST. Listen in on your local station. Listen in each Monday.

ZOOLOGY

NATURE RAMBLINGS
by Frank Thone

Bats as Pets

BATS would seem to be about the world's worst bet as possible pets, yet they have been tamed at least to the extent of willingly accepting food from human fingers, reports Dr. Glover Morrill Allen, curator of mammals in the Harvard University museum of comparative zoology, in a new book on bats. (*S.N.L.*, Sept. 23.)

The way to a bat's heart, no less than to a man's, lies over that well-worn threshhold, the stomach. Bats are voracious creatures, always hungry, as small and highly active animals usually are. They will struggle and try to bite when first made captive, but if you poke a choice insect tidbit between their gnashing teeth they apparently forget their hostility very quickly. Dr. Allen even tells of one which he pacified by giving drops of water on the end of a lead-pencil while he held the little mammal in his other hand.

Bats are apparently ready for any kind of insect food, even unfamiliar sorts; for after inducing his newly captured pet to slake its thirst, Dr. Allen presented it with a gift of mealworms purchased at a bird store. It is highly unlikely that bats ever encounter mealworms in the course of their ordinary nocturnal hunting; nevertheless this bat evidently liked the taste of the first one offered:

"His jaws closed in a viselike grip, his sharp canines puncturing the plump body of the mealworm as if it were a 'hot-dog'. His whole attitude was one of fierce resistance, with every intent to vent his fury on whatever disturbed his peace. Then, suddenly, as the tasty juice oozed into his mouth, his entire behavior changed. The tense jaw muscles relaxed, his defiant squeaks ceased, and I could sense the working of his mind as his wrath abated and he began to taste the squirming morsel with rising interest.

"In a few seconds all recollection of his situation seemed to have vanished, while the unfortunate mealworm, chewed over from end to end, was promptly swallowed, and my captive looked up hopefully for more. One after another he chewed down two dozen mealworms, and by now we had established friendly relations."

It is a good thing that bats can be thus quickly tamed, for it never pays to keep them more than a few days in captivity. They are obviously not fitted for a "cage-bird" existence, and will die if kept in too close confinement. Dr. Allen does tell, however, of several instances in which bats come to regard human beings as dependable sources of provender, and would report regularly at mealtimes.

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VOLCANOLOGY

"Baby" Volcano Nestles At Its Mother's Feet

See Front Cover

A "BABY" volcano which nestles at its mother's feet in Guatemala may become the scene of operations of a new expedition in volcanology to be sent out by Carnegie Institution of Washington early in December.

Towering Santa Maria is the parent volcano and little Santiaguito is the baby. Both are shown on the front cover of this week's SCIENCE NEWS LETTER. The diminutive is used only in a relative sense for Santiaguito rises 1,200 feet off the floor of Santa Maria's old crater which formed in the gigantic eruption of 1902 at the same time that Mt. Pelee was bringing havoc by its eruption in Martinique.

Carnegie Institution scientists, headed by Dr. E. G. Zies, of the Geophysical Laboratory, will study the rock masses slowly being extruded from Santiaguito and analyze the corrosive gases of sulfur dioxide, hydrofluoric acid and sulfuric acid which are found mixed with the steam being liberated.

The new volcano dome has risen rapidly, for it began to form in 1922. It was nearly 1,000 feet high within three years and has been pouring out nearly a constant volume of semi-plastic heated rock ever since. Because its base is constantly growing larger, its increase in height becomes slower each year.

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•First Glances at New Books

Additional Reviews On Page 224

Medicine

THE STORY OF SURGERY—Harvey Graham—*Doubleday, Doran,* 425 p., $3.75. Surgery will become an unnecessary art, except for accidents and war, the greatest of all accidents. This is the prediction of a Harley Street (London) surgeon who writes under a pseudonym of the long history of surgery. His conclusion: "Surgery deals with the failures of medicine. One day complete success will be recorded by the physicians, and at that moment the surgeon must needs drop his scalpel."

Science News Letter, September 30, 1939

Architecture

CAMPS AND COTTAGES, How to Build Them Yourself — Charles D. White — *Crowell,* 235 p., $2. You'll want to get your hammer, nails and saw and begin work immediately. This is a practical book because an architect and his son built a camp themselves.

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Meteorology

THE WEEKLY PERIOD IN WASHINGTON PRECIPITATION — C. G. Abbot and N. M. McGandlish—*Smithsonian Inst.,* 4 p., 5c. (Smithsonian Miscellaneous Collections, Vol. 98, No. 21). See *SNL,* Aug. 26.

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Mineralogy

THE HELT TOWNSHIP (INDIANA) METEORITE—Stuart H. Perry—*Smithsonian Institution,* 7 p., 9 pl., 25c.

Science News Letter, September 30, 1939

Entomology—Medicine

MEDICAL ENTOMOLOGY WITH SPECIAL REFERENCE TO THE HEALTH AND WELL-BEING OF MAN AND ANIMALS (3d. ed.) —William B. Herms—*Macmillan,* 582 p,. $5.50. This new edition takes full advantage of the great strides that have been taken in the study of insect vectors in the half-dozen years that have passed since the appearance of the second edition. Public health aspects receive especial attention.

Science News Letter, September 30, 1939

Genetics

YOU AND HEREDITY — Amram Scheinfeld—*Stokes,* 434 p., $3. A highly readable book, written by a layman with the cooperation of many scientists. If you wonder why you look like Great-Aunt Sarah or whether it is safe for cousins to marry or what eugenics and sterilization of the unfit are all about, or whether your baby will inherit his father's keen mind, you will want to read this book. Publication was delayed until September and the price reduced to $3 when it was selected by the Book of the Month Club.

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General Science

CONQUESTS OF SCIENCE—Ray Compton and Charles H. Nettels, eds.—*Harcourt, Brace,* 378 p., Text ed., $1.20; Trade ed., $1.75. This book contains a collection of essays by various well-known scientists which describe in general the broad outlines of science in its various fields. Of the value of the book, the editor says: "(1) Each selection is good science in that it is authentic material written by a recognized science writer. (2) Each chapter is written in an interesting manner, and (3) There is no section too difficult for the beginning student."

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Photography

THE TECHNIQUE OF PICTORIAL PHOTOGRAPHY—Paul L. Anderson—*Lippincott,* 403 p., $3.50. This book brings up to date the information in Mr. Anderson's older book *Pictorial Photography: Its Principles and Practice.* It is a needed handbook for pictorial photographers.

Science News Letter, September 30, 1939

Geography—Economics

LAND OF THE SOVIETS: A Handbook of the U. S. S. R.—Nicholas Mikhailov, translated by Nathalie Rothstein—*Lee Furman,* 351 p., $2.50. A geographic account of present-day Soviet republics, including much about resources and industrial trends, and details of the Third Five-Year Plan, started in 1938. The volume is supplied with a good index, photographs, and maps.

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Economics

HOW WE GET OUR FOOD—Ethel K. Howard — *Harcourt, Brace,* 111 p., $1.25. An attractively illustrated science reader, in agriculture and its dependent industries, for the lower grades.

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Genetics

AN INTRODUCTION TO GENETICS — A. H. Sturtevant and G. W. Beadle—*Saunders,* 391 p., $3.25. A new textbook in genetics, with a new approach. The assumption is made that the student is already sufficiently grounded in general biology, and the start is therefore made at once with chromosomes: a considerable saving in time.

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Geography

ICELAND, The First American Republic—Vilhjalmur Stefansson—*Doubleday, Doran,* 275 p., $3.50. Dr. Stefansson says that when Iceland was discovered the New World was discovered. Iceland became the first republic in the Western Hemisphere. With such distinctions accorded it, the island under Dr. Stefansson's skillful authorship gains the reader's attention and holds it. The greater part of the book is devoted to Iceland today, and even includes practical advice and information for tourists adventurous enough to roam off the beaten track.

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Photography

THE AMERICAN ANNUAL OF PHOTOGRAPHY (Vol. 54)—Frank R. Fraprie and Franklin I. Jordan, editors—*American Photographic Pub. Co.,* 322 p., paper $1.50, cloth $2.25. In addition to the generous collection of very beautiful photographs, this annual contains several authoritative articles of technical interest and the Who's Who in Pictorial Photography.

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History

GERMANS IN THE CAMEROONS, 1884-1914 — Harry R. Rudin — *Yale Univ. Press,* 456 p., map, $4. A study of imperialism in a single region of the modern world. To make this survey, Mr. Rudin gave ten years to research of source materials, life among natives in the Cameroons, and talks with former German officials of the colony. His verdict is that evils in German colonial administration "are neither greater than nor different from those existing in any other colonial system" and that Germany there deserves credit for "a record of unusual achievements."

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Sociology

RACE RELATIONS AND THE RACE PROBLEM—Edgar T. Thompson, ed.—*Duke Univ. Press,* 338 p., $3.50. Discussion and facts by eleven sociologists on the relationships between white and Negro races, particularly in the South. The effect of the Negro on the white man is an angle believed neglected. The volume, which the editor hopes will not be merely another book on the Negro, analyzes such matters as racial competition for land, labor problems, and patterns of race conflict.

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•First Glances at New Books

Additional Reviews On Page 223

Physics

ATOMS IN ACTION—George Russell Harrison—*Morrow*, 370 p., $3.50. The world of creative physics is described vividly and expertly by the director of the research laboratory of experimental physics at the Massachusetts Institute of Technology and authority on spectroscopy. The American Institute of Physics for several years has wanted a book that would present the accomplishments of physics as effectively as Slosson's classic "Creative Chemistry." This book is nominated. Energy, farming, sound, glass, light, electrons, spectrograms, radium, lenses, television, photography, music, weather, aviation and the future mingle in the 16 interesting chapters.

Science News Letter, September 30, 1939

Archaeology

ETRUSCAN PERUGIA—Chandler Shaw—*Johns Hopkins Press*, 102 p., 16 pl., $2.75. Political history and the course of civilization in a leading Etruscan city-state are traced in this monograph. Archaeological evidence provides most of the material for reconstructing the cultural picture.

Science News Letter, September 30, 1939

Botany

THE ANDEAN SPECIES OF PILEA—Ellsworth P. Killip—*Govt. Print Off.*, 65 p. 15c. (Contributions from the U. S. Nat'l Herbarium, Vol. 26, pt. 10)

Science News Letter, September 30, 1939

Psychology

CALIFORNIA SHORT FORM TEST OF MENTAL MATURITY; Preprimary Series (Kgn-Ent. 1), Primary Series (Grs. 1-3), Elementary Series (Grs. 4-8), Intermediate Series (Grs. 7-10), and Advanced Series (Grs. 9-Adult)—Elizabeth T. Sullivan, Willis W. Clark and Ernest W. Tiegs—*California Test Bureau, 3636 Beverly Blvd., Los Angeles, Calif.*, 75c per 25 tests.

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Bibliography—Medicine

JOHN HOWARD (1726-1790) HOSPITAL AND PRISON REFORMER: A BIBLIOGRAPHY—Leona Baumgartner—*Johns Hopkins Press*, 79 p., $1.

Science News Letter, September 30, 1939

Ethnology—Economics

THE ESKIMO AND HIS REINDEER IN ALASKA—Clarence L. Andrews—*Caxton*, 240 p., $3.50. What it is like to be an Eskimo, and particularly what the reindeer situation is up in Alaska, are told in this informal, homely book by a man who has lived and worked among these people. He tells of "chaos" which business interests wrought when white men entered the native reindeer industry, and present efforts of the Government to protect the natives' interests.

Science News Letter, September 30, 1939

Economics

REVIEW OF WORLD TRADE, 1938—League of Nations—*Columbia Univ. Press*, 85 p., 60c.

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Engineering

THE STOREHOUSE OF CIVILIZATION—C. C. Furnas—*Teachers College, Columbia Univ.*, 562 p., $3.25. The use and development of metals, non-metals, energy supplies, and chemical products are told in this volume by Yale's writing chemical engineer. Intended for broadening the background of teachers, who will read it with pleasure, the book will attract and inform many others.

Science News Letter, September 30, 1939

Archaeology

MODIFIED BASKET MAKER SITES, ACKMEN-LOWRY AREA, SOUTHWESTERN COLORADO, 1938—Paul S. Martin—*Field Museum of Natural History*, 499 p., $3. Report on excavation of two sites which offer "a fair sample" of typical Basket Maker culture in this region. The report, says Dr. Martin, finishes Field Museum's work in the area, for cultures have now been traced there from 700 A.D. to the Great Pueblo period, about 1150.

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Education

THE EFFECT OF VARIED AMOUNTS OF PHONETIC TRAINING ON PRIMARY READING—Donald C. Agnew—50 p., $1.

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Aeronautics

ABC OF AVIATION (Rev. and Enl.)—Victor W. Page—*Henley*, 418 p., $2.50.

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Archaeology

LA TECHNIQUE DES FOUILLES—Office International des Musées—*Institut International de Coopération Intellectuelle*, 232 p., $2.25 (Mouseion, Vol. 45-46) This entire issue of the quarterly Mouseion is devoted to a manual in French on the technique of archaeological excavation. The treatise extends beyond actual digging to include problems of international documentation and educational values of excavation sites.

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Economics

THE STRUCTURE OF THE AMERICAN ECONOMY, Part I. Basic Characteristics—National Resources Com.—*Govt. Print. Off.*, 396 p., $1. A detailed and exhaustive examination of the economic structure of the country in relation to national resources. The committee especially deplores the tremendous waste of manpower (estimated at 200 billion dollars) represented by unemployment during the depression period.

Science News Letter, September 30, 1939

Music—Ethnology

NOOTKA AND QUILEUTE MUSIC—Frances Densmore—*Govt. Print. Off.*, 358 p., 50c. Another of Miss Densmore's remarkably comprehensive studies of America's Indians, from the standpoint of the role music plays in their lives. The manner of living and the songs of Northwest Coast Indians—sturdy fighters, whalers, lavish givers at potlatch festivities—are here recorded.

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Archaeology

ARCHAEOLOGY OF SANTA MARTA, COLOMBIA, The Tairona Culture. Part II, Section 2, Objects of Pottery—J. Alden Mason—*Field Museum of Natural History*, 418 p., $2.50. Illustrated by plates and drawings, this section of the report is restricted to factual description of clay objects, mainly those collected by Dr. Mason and now in Field Museum. Observations and conclusions are reserved for a later publication.

Science News Letter, September 30, 1939

History

THE CONQUEST OF A CONTINENT—Chase S. Osborn and Stella Brunt Osborn—*Science Press*, 190 p., $3. The boundary line that divides the United States from Canada is the subject of this book, behind the somewhat obscure title. The authors rightly regard the boundary as one of the world's wonders. With this interest-arousing introduction, they proceed to a factual presentation of the historic arguments, negotiations, and agreements in the "task for Titans."

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Political Science

CLIPPERS AND CONSULS—Eldon Griffin—Edwards Bros., *Obtainable from Dale S. King, Southwestern Monuments Assoc., Coolidge, Arizona*, 533 p., $10. American consular and commercial relations with Eastern Asia, 1845-1860. Lithoprinted.

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